

US006304516B1

(12) United States Patent LeBrun

(10) Patent No.:

US 6,304,516 B1

(45) Date of Patent:

Oct. 16, 2001

BIMODAL TRANSDUCER Inventor: Scott W. LeBrun, Middletown, RI (US) (75)Assignee: The United States of America as represented by the Secretary of the Navy, Washington, DC (US) Subject to any disclaimer, the term of this Notice: patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days. Appl. No.: 09/638,531 (21) (22)Filed: Aug. 14, 2000 Int. Cl.⁷ H04R 23/00

Field of Search 367/163, 165,

367/173, 174, 157; 310/337, 334, 324,

TRANSDUCER SHELL ASSEMBLY FOR A

(56) **References Cited**U.S. PATENT DOCUMENTS

* cited by examiner

Primary Examiner—Daniel T. Pihulic (74) Attorney, Agent, or Firm—Michael C. McGowan; Prithyi C. Lall; Michael F. Oglo

(57) ABSTRACT

A transducer shell assembly and bimodal transducer are provided. The transducer shell assembly has a hollow split tube such that a gap extends along its length to define first and second opposing edges. A locking mechanism can lock the first and second opposing edges in a fixed relationship to fix the gap. In terms of the bimodal transducer, an electromechanical driver is coupled to an inside surface of the tube. A first frequency of operation is defined when the gap is fixed, while a second frequency of operation is defined when the first and second opposing edges are free to move with respect to one another.

18 Claims, 2 Drawing Sheets

